

HYPERTONIC SALT SOLUTION INTRAVENOUSLY AS A TEST FOR CORONARY DISEASE

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Among the patients, who consult the heart clinic, there are some who can be diagnosed only by clinical means. In patients who present some vague præcordial and thoracic complaints of anginal character, we thought it would be advantageous to add to our diagnostic methods a new test that would give us an objective sign of angina pectoris.

The anoxæmia and exercise tests are already used successfully. The method we have used was proposed by Scherf and Weisberg, and repeated by Lequime and Denolin in 1945, but does not seem to be in prevalent use. We repeated the observations of Lequime and Denolin in cases from our outpatient department who presented with anginal pains.

The patients chosen presented with angina; however the clinical, fluoroscopic, and electrocardiographic examinations were normal, not giving any objective signs of angina, except that two of them showed slight modifications of the T waves.

After completion of the above routine examinations, we injected rapidly in the antecubital vein of one or the other arm 40 ml. of a 20 per cent solution of sodium chloride. We noted the physical reactions of the patients during and some minutes after the injection. In order to give time for the development of any electrocardiographic modifications, we repeated the cardiogram eight minutes after the injection of the hypertonic salt solution, using the three standard leads and the unipolar limb and præcordial leads. We compared then the cardiogram taken after the injection of the hypertonic solution with that taken before the injection, and noted any resultant modifications.

We studied twenty patients, ten men and ten women. The patients were aged between 32 and 69 years. The most frequent symptom noted was substernal, præcordial, or thoracic pain, with or without radiation to the shoulders, the arms, and the neck. The pain appeared characteristically after exercise, but occasionally in the resting position. Many patients complained of shortness of breath after exercise. Other less frequent symptoms were palpitation, headache, dizziness, oppression, and weakness.

Examination of the lungs was normal by physical means. The heart was either normal or presented some auscultatory sign such as an apical systolic murmur, a split second sound, a snapping second sound, distant heart sounds, or tachycardia. The blood pressure was normal in the majority of the cases; 8 of the 20 patients had increased pressures. The systolic pressure of the 20 patients ranged between 120 mm. and 230 mm., the diastolic pressure between 70 mm. and 130 mm. In three cases the heart was slightly enlarged on fluoroscopy; in one the hilar markings were increased; in another the apex was slightly immobile.

During the injection of the hypertonic solution the majority of the cases presented a sensation of warmth on the face and head; occasionally they experienced a sensation of warmth in different locations of the body, or at other times a burning sensation in the throat, pain in the left shoulder, headache, nervousness, drowsiness, or torpor.

Before the injection, the electrocardiogram was normal in 18 cases. In the remaining two we observed a slightly negative T wave in leads I and II, in VL, and in V4, V5 and V6.

In the great majority of the cases the electrocardiogram did not show any modification after the intravenous injection of the hypertonic salt solution.

In one-third of the cases we noted some insignificant modifications, which did not permit the diagnosis of angina pectoris. In only one case did we find a characteristic change: an elevation of 2 mm. of the S-T segment in V1 and V2 and a depression of 2 mm. of the S-T segment in leads V4 and V5.

In half of the cases the diagnosis of angina pectoris was made clinically. The rest of the cases were diagnosed as intercostal or thoracic pains or as pain of psychosomatic nature.

SUMMARY AND CONCLUSIONS

The test using an intravenous injection of a hypertonic salt solution was done on twenty patients who presented with pain in the chest. In eighteen the electrocardiogram was normal before the injection of the hypertonic solution. In the other two there was a negative T wave in leads I, II, VL, and V4, V5, and V6.

An intravenous injection of 40 ml. of a 20 per cent sodium chloride solution was given and a second electrocardiogram was taken eight minutes after injection. In two-thirds of the cases, the electrocardiogram taken after the injection of the hypertonic solution showed no modification in relation to the tracing taken before injection. In the remaining third, insignificant modifications were noted, which were not considered of clinical importance; thus it was not possible to diagnose angina pectoris from these changes alone. In only one case following the injection of hypertonic salt solution did a significant change of the S-T segment occur.

In conclusion, the intravenous injection of hypertonic salt solution does not, in the great majority of the cases, give rise to significant modifications of the electrocardiogram. The use of this test can not replace the exercise or the anoxæmia tests in the diagnosis of angina pectoris, which have been shown to be of value in other series of similar cases.

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